

# Contact us

T: +44 (0)1772 622200

E: [contactus@jfnl.co.uk](mailto:contactus@jfnl.co.uk)

W: [www.jfnl.co.uk](http://www.jfnl.co.uk)

James Fisher Nuclear Limited  
Gordon House, Sceptre Way, Bamber Bridge, Preston PR5 6AW

James Fisher Nuclear Limited is registered in Scotland:SC204768 North Meadows, Oldmeldrum, Inverurie, Aberdeenshire, AB51 0GQ.  
James Fisher Nuclear Limited is a subsidiary of James Fisher and Sons plc.



**James Fisher**  
**Nuclear**



**James Fisher**  
**Nuclear**

# Delivering Specialist Engineering and Technical Services for the Nuclear Industry





## What we do

Calling on the expertise of our highly skilled workforce, and our experience spanning four decades, JFN tackles some of the largest and most difficult technical, manufacturing and decommissioning challenges presented by the nuclear industry. Our expertise and understanding of the nuclear environment lets you call on our extensive range of specialist capabilities, to provide significant added value to your project.

We operate our own in-house design and manufacture, test facilities and site service operations enabling us to offer a full spectrum of services. From individually tailored designs to complete, large scale, turn-key solutions, we ensure the most complex and critical nuclear projects are delivered safely, on time and within budget.

James Fisher Nuclear is an important part of the FTSE 250 James Fisher and Sons PLC, a leading provider of marine and engineering services and can leverage its own substantial nuclear resources with those of the James Fisher group and its supply chain to deliver projects across the full lifecycle.





## Remote handling

Our customers need safe, simple and cost effective solutions that really deliver.

We know the nuclear industry is a challenging environment for original equipment suppliers with risk factors including; radiation, humidity, corrosive environments and potential ATEX atmosphere requirements. Making adherence to international design standards, plus all relevant safety, material traceability and weld compliance requirements, BS EN 61508 compliance and full safety case integration essential. JFN further enhances this with independent peer review of our designs and documentation, so you can be confident we provide equipment that complies with the most exacting of safety standards and gets the job done.

We have for over 40 years delivered successful remote handling systems and equipment to assist with operational and decommissioning projects in high hazard environments for the nuclear industry. From simple low cost long reach tooling to complex high value multi-axis systems, JFN has an excellent track record of providing innovative and cost effective applications to address unique remote handling challenges.

JFN has industry leading experience in developing and modifying Commercially Off The Shelf (COTS) technology to allow proven technology to be integrated with remote handling systems to bring you the most cost effective and efficient solution.

Our multi-disciplined engineering teams can also draw upon in-house engineering and calibration capabilities to develop tailor made solutions and provide our clients with a turnkey remote handling solution or any part of the project life-cycle from concept design through to detailed design, manufacture and testing.

In addition, JFN often provides installation, operational, maintenance support and support with eventual decommissioning of the equipment.



## Remote Inspection

JFN has extensive experience in carrying out remote inspections on operational and legacy nuclear plants, in a wide range of environments including high radiation, corrosive and chemically toxic areas in gaseous and aqueous conditions. Every inspection requirement has its own access challenge with limited entry routes available, and care is required to ensure that equipment can always be safely retrieved, whatever the eventuality. To address this requirement James Fisher Nuclear (JFN) specialises in the deployment and safe recovery of plant characterisation systems using a wide variety of sensors including:

- Camera systems
- LASER scanning systems
- Radiation detection and identification systems
- SONAR
- Ultrasound and Eddy Current probes for non-destructive examination of vessel integrity
- Sampling systems
- Chemical sensors
- Temperature sensors

## Remote Cutting

JFN has experience of remotely deploying a wide variety of hot and cold cutting technologies in decommissioning projects. Cutting techniques include:

- Hydraulic shears
- Reciprocal and rotating saws
- Grinders
- Diamond wires
- Water jets
- Oxy-propane and plasma torches
- LASERS

This unparalleled practical experience in the design, development and deployment of cutting systems accompanied by each techniques performance and deployment issues enable JFN to deliver the right cutting system to meet your specific requirements.





### Remote repair systems

Remote repair is required where access restrictions or radiation levels prevents manual plant maintenance. JFN has a track record in designing and delivering remote repair systems which include fault detection, surface preparation, the repair and final inspection for tasks in difficult to access and high radiation locations.

### Reactor Segmentation

The combination of remote inspection, remote handling and remote cutting expertise is essential for decommissioning nuclear reactor cores. JFN has experience of carrying out this work at the Windscale Advanced Gas-cooled Reactor (WAGR), playing a key role in the decommissioning of the reactor internals, the pressure vessel and insulation. JFN activities included: Optioneering & Feasibility Studies; Design and manufacture of tooling and electrical control systems; Development of Systems and Techniques; Manufacture; Test rigs and Trials and Training.

JFN has recently been awarded a contract by Magnox (Winfrith) to deliver a facility for the remote segmentation and packaging of the reactor core of the redundant Steam Generating Heavy Water Reactor (SGHWR) located at Winfrith in Dorset.

### Multi-axis Machines, Manipulators and Tooling

James Fisher Nuclear has over thirty years of experience in the design, manufacture and commissioning of multi-axis systems, manipulators and tooling for use in nuclear power plants and a wide range of nuclear fuel cycle facilities. These support a wide range of characterisation, inspection and remote handling tasks in operational plants and those undergoing decommissioning.



### Robust, reliable and powerful, ModuMan® 100 is the manipulator workhorse for the nuclear industry.

A heavy duty modular power manipulator, constructed from commercially available actuators, resolvers and sensors. Suitable for horizontal or vertical mounting applications with a high degree of dexterity and capable of lifting a 100kg payload across its entire operational envelope.

Standard model design parameters: (6 degrees of freedom/2.5m envelope/100kg payload)

### ModuMan® Long Reach takes the winning formula to a 4.2m reach and beyond

ModuMan® Long Reach is a heavy duty, long reach, lightweight, hydraulic power manipulator with proven reliability, dexterity and ergonomics. A modular and scalable design means it can be modified to tackle a wide range of projects needs making it a highly versatile tool.

Standard model design parameters : (7 degrees-of-freedom penetration sizes from 9" (229mm) in diameter; 4.2m envelope/ maximum 50kg payload in all orientations)

### ModuMan® Link

A mast mounted, medium duty, multi-link manipulator designed for vertical deployment into tanks, vaults, etc.

Standard model design parameters: (3 degrees of freedom/5.0m vertical reach/4.0m horizontal reach/360 degree rotation/60kg payload)

### ModuMan® Cave

A rugged, heavy duty, power manipulator, incorporating a telescopic boom. Ideally suited to deliver reliable operation under extremely arduous physical conditions.

Design parameters: (6 degrees of freedom/ 2.0m envelope/200kg payload)





### Moduman® Inspector

A lightweight manipulator for inspection and maintenance tasks within a high radiation environment. The ModuMan is installed as a retractable manipulator arm mounted within a deployment vessel and is deployed vertically via a 12" diameter access route into its operational area. Design parameters: (6 degrees of freedom/5.0m envelope/15kg payload)

### Accessories and Tooling

#### Remote tool change carousel

An in-cell facility to permit the remote storage and exchange of powered end effectors via multiple Portable Arterial Connection System (PACS) stations.

#### Mounting table

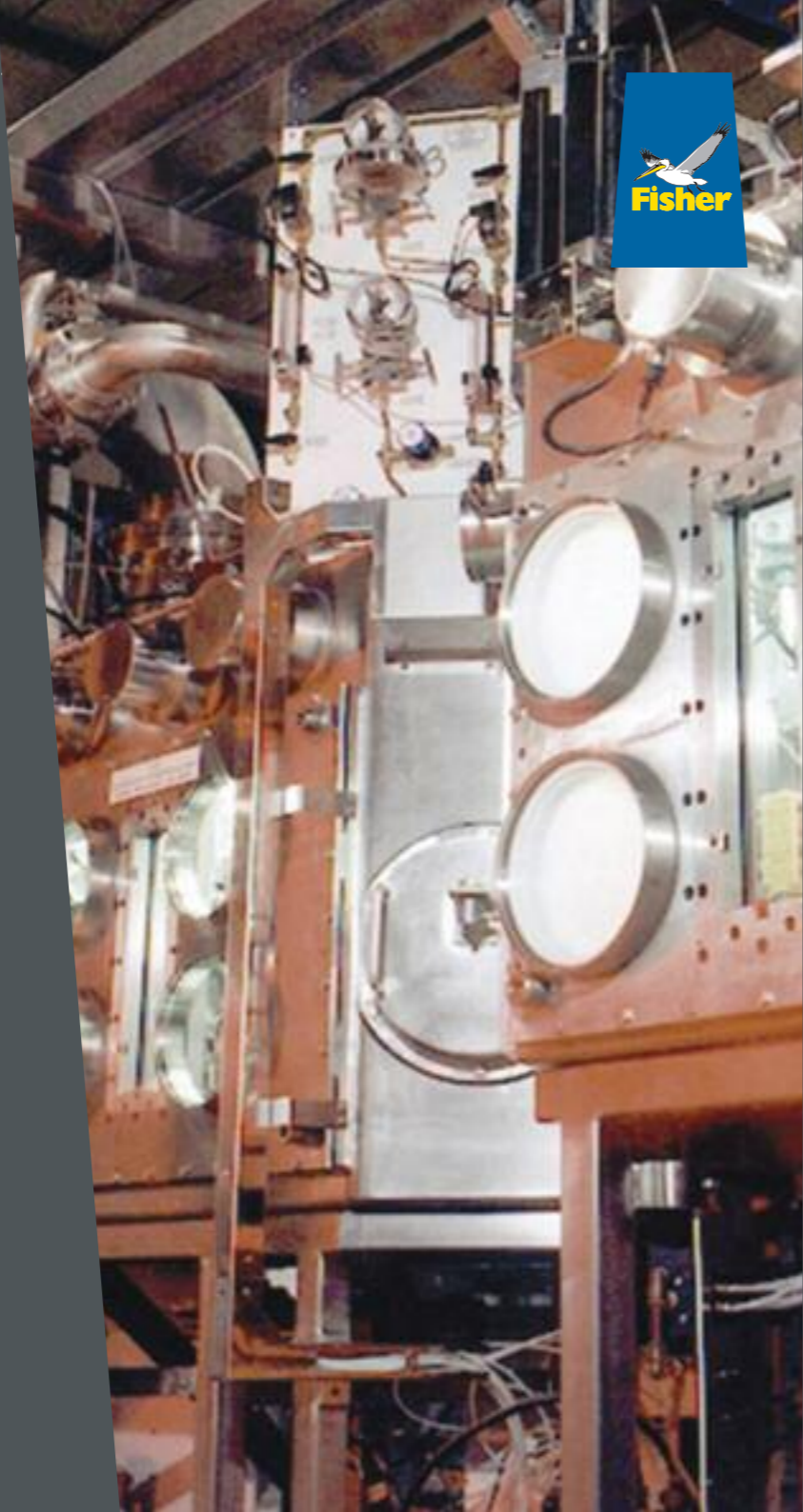
Multiple manipulators may be remotely mounted and serviced via a common, adjustable in-cell support platform.

#### Decontamination booth

A self contained, remotely controlled facility to enable the decontamination of equipment prior to manual intervention operations.

#### End Effectors

JFN has designed, built and tested a wide range of end effectors enhancing the functionality, efficiency and reliability of multi axis systems.



### Long Reach Tooling

JFN has many years experience in the design, manufacture, testing and deployment of long reach tooling, which is typically deployed manually or from hoists or cranes.

Applications include tank sampling; retrieval of loose materials; extraction of liquids and sludges; removal of blockages; deployment of cutting and dismantling equipment; deployment of hooks and grabs.

### ROVs

James Fisher Nuclear has been working extensively with ROVs on land, in the air and underwater in the nuclear industry for over 30 years and deliver innovative and successful deployment within operational and decommissioning and inspection projects.

- Upgrading of commercially available ROVs, sensors and tooling for hazardous areas
- Design, manufacture and testing of new sensors and tooling for novel applications
- Safety case compliance
- Dedicated test and training facilities
- Proven procurement system
- Dedicated personnel
- Compliance with standards and regulations

JFN take the most cost effective and timely route, by taking proven and commercially available ROVs widely used in non-nuclear industries often with tens of thousands of operational hours and modify these for applications in the nuclear environments.





## Trials Training and Simulation

James Fisher Nuclear (JFN) has extensive rig hall facilities with a wide and an enviable track record in practical research and development, operational trials and training and simulation of hazardous environments.

The practical demonstration of a concept, validation of the methodology and final testing of a completed approach has distinct advantages over desk-based studies and modelling and has proven to remove risk and prevent problems occurring after deployment of a system in a hostile environment. Modifications can be made as part of an iterative development process carried out in the safety of a controlled testing facility, allowing projects to move efficiently from a Technology Readiness level (TRL) of above 3 (validated proof of concept) to TRL8 (System complete and qualified through test and demonstration) and demonstrating that equipment developed and designed for other industries has been successfully adapted for use in a nuclear environment.

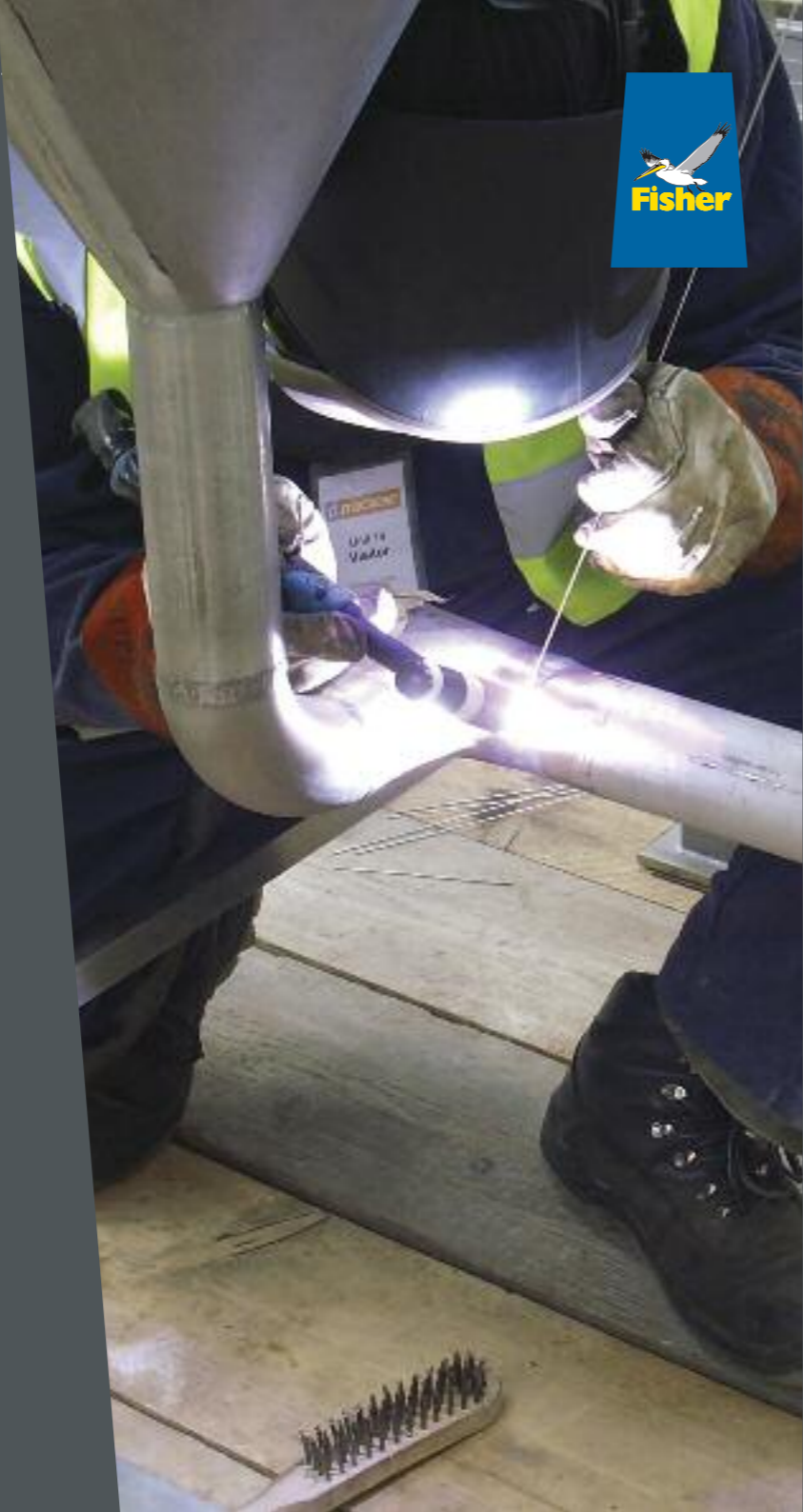
## Modular and Containerised Systems

In both the nuclear and offshore industries we can provide equipment for short to medium term support of maintenance and decommissioning using robust and reliable modular systems which can be deployed at short notice and then recovered.

This allows you better space utilisation, reduces your maintenance burdens as the equipment is supplied in a 'plug and play' state, and substantially reduces your capital costs for installed hardware and infrastructure with increased resource sharing across facilities.

Deploying equipment from a simple generator to a comprehensive waste processing suite in a modular and containerised format has many distinct benefits over traditional construction and James Fisher Nuclear has many years' experience in the design, build and test of these systems within the nuclear industry.

JFN has supplied a comprehensive range of modular systems, from single container stand-alone single function modular equipment, to complex integrated systems in a suite of multiple containers.



Our strategy is to maximise the use of existing, proven technologies into the design of its equipment and systems. Meaning we can reduce technical risk, minimise costs and ensure accurate lead times for deployment delivering enhanced value for money to you the client.

The benefits of modular containerised systems are:

- Rapid realisation and delivery compared to fixed plant installation
- Minimised site infrastructure requirement and significantly reduced disruption to your site operations
- Modular systems are ideal for projects requiring temporary resources or as an addition to existing capacity such as for site demolition and decommissioning projects
- Integration of best available technology and use of commercially available items where available/applicable
- De-risks the design process
- Full assembly, testing and inactive commissioning can be completed off site to give the shortest possible installation and commissioning programme at site
- De-risks site based activities
- Simplified opportunities to develop/augment plant should operational requirements dictate
- Simplified decommissioning by process and/or module and the opportunity to redeploy

Modular systems designed and supplied by JFN have including the following:

- Breathing Air System
- Mobile Change Rooms
- Ventilation Plant
- Steam Generator System
- Decontamination Facility
- Waste Import/Export Facility
- Waste Sorting Facility
- Grouting and Encapsulation Facility
- Waste Characterisation Equipment

JFN has also integrated several modular systems to provide complex facilities supporting:

- Waste Repackaging
- Waste Recovery
- Waste Processing and Treatment, including a Liquid Effluent Treatment Plant

